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L11: Entry 91 of 101 File: DWPI

DERWENT-ACC-NO: 1972-74448T
DERWENT-WEEK: 197247

TITLE: Sliced cheese prodn machine - for processed cheese with inter slice release agent

PATENT-ASSIGNEE:

ASSIGNEE	CODE
KRAFTCO CORP	KRFT

PRIORITY-DATA: 1971US-0141050 (April 29, 1971)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DE 2219629 A			000	
CA 992382 A	July 6, 1976		000	
DE 2219629 C	July 21, 1983		000	
GB 1318849 A			000	

INT-CL (IPC): A01J 27/02; A23C 19/16

ABSTRACTED-PUB-NO: DE 2219629A
BASIC-ABSTRACT:

Band cost processed cheese mix is cut into long continuous strips which are laminated into a bar for cutting and packing. To prevent the strips from sticking together and to thereby ease peeling off for use by the consumer at least one face is sprayed with an aq. dispersion of a pasteurized hydrocolloid esp. corn starch the conc. of the dispersion being 2-10 % and the resultant surface density of hydrocolloid being 0.01-1.0 gm per 0.093 m2.

TITLE-TERMS: SLICE CHEESE PRODUCE MACHINE PROCESS CHEESE INTER SLICE RELEASE AGENT

DERWENT-CLASS: D13 P13

CPI-CODES: D03-B06;

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L11: Entry 43 of 101 File: DWPI Jan 31, 2000

DERWENT-ACC-NO: 1992-402953
DERWENT-WEEK: 200010

TITLE: Laminated cheese prepn. with easy peel sepn. - by forming continuous wave shape by extrusion before laminating

PATENT-ASSIGNEE:

ASSIGNEE	CODE
SNOW BRAND MILK PROD CO LTD	SNOW

PRIORITY-DATA: 1991JP-0085722 (March 27, 1991)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
JP 3004073 B2	January 31, 2000		006	A23C019/08
JP 04299939 A	October 23, 1992		007	A23C019/08

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
JP 3004073B2	March 27, 1991	1991JP-0085722	
JP 3004073B2		JP 4299939	Previous Publ.
JP 04299939A	March 27, 1991	1991JP-0085722	

INT-CL (IPC): A23C 19/08

ABSTRACTED-PUB-NO: JP 04299939A
BASIC-ABSTRACT:

Fused cheese is extruded to form continuous wave shape on one or both sides. The sheet state cheese is laminated.

USE - The cheese is easily peeled. Such effect lasts for long term. It is produced efficiently and yield is increased.

CHOSEN-DRAWING: Dwg.0/3

TITLE-TERMS: LAMINATE CHEESE PREPARATION EASY PEEL SEPARATE FORMING CONTINUOUS WAVE SHAPE EXTRUDE LAMINATE

DERWENT-CLASS: D13

CPI-CODES: D03-B06;

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: C1992-178747

PATENT SPECIFICATION (11) 1 318 849

DRAWINGS ATTACHED

1 318 849

(21) Application No. 14863/72 (22) Filed 29 March 1972 (19)
(31) Convention Application No. 141 050 (32) Filed 29 April 1971 in
(33) United States of America (US)
(44) Complete Specification published 31 May 1973
(51) International Classification A23C 19/14 19/16
(52) Index at acceptance
A2B 14

(54) SLICED CHEESE PRODUCT AND METHOD FOR TREATMENT THEREOF

(71) We, KRAFTCO CORPORATION, a corporation organized under the laws of the State of Delaware, United States of America, of 260 Madison Avenue, City of New York, County of New York, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates generally to a method for treating cheese products which are formed into stacked slices so as to minimize sticking of the slices to each other. More particularly, the present invention relates to a method for applying a thin coating of a hydrated hydrocolloid to cheese products which are formed into stacks of individual slices of cheese.

Methods for the manufacture of stacked individual slices of cheese are well known in the cheese art. United States Letters Patent No. 2,352,210 to Kraft, issued June 27, 1944, discloses apparatus for continuously producing a plurality of ribbons of a cheese product and for stacking and cutting such ribbons to form stacks of individual slices of cheese. The stacked slices of cheese are then packaged to provide a package to provide a package of individual slices of cheese which may be removed, one by one, by the consumer as they are required. However, the manufacture of stacks of individual slices of cheese products has been limited to a relatively few types of cheese products because of problems relating to sticking together of individual slices in the stack. In this connection, the manufacture of stacks of individual slices of cheese has been primarily limited to certain types of process cheese.

The term "process cheese" as used herein refers to cheese which is made by grinding and mixing together by heating and stirring one or more natural cheeses of the same or two of more varieties. An emulsifying agent is added to the mixture, and the mixture is worked into a homogeneous plastic mass. Various acids may be added, such as lactic acid, citric acid, acetic acid, phosphoric acid or vinegar. A small amount of cream, water, salt, color and spices or flavoring materials may be added. The moisture level of process cheese generally does not exceed 40 percent. Process cheese has a minimum fat level of about 50 percent on a dry basis.

As indicated, the preparation of stacks of individual slices of cheese has generally been restricted to certain types of process cheese. When high levels of aged cheese are used in the manufacture of process cheese, there is a tendency for individual slices in the stack to stick together. Also, it has not been generally considered feasible to prepare stacks of individual slices of cheese food or cheese spread. The term "cheese food" as used herein refers to a cheese product which is prepared generally from the materials, and the procedure indicated above for process cheese. However, cheese food may have optional dairy ingredients added thereto, such as cream, milk, skim milk, cheese whey or any of these from which part of the water has been removed. The moisture level is generally higher than that of process cheese, and may be up to about 44 percent. The fat is at least about 23 percent of the cheese food product but is usually less than 50 percent. The term "cheese spread" refers to a cheese product which is generally similar to cheese food products but may have a moisture level of up to about 60 percent. The minimum fat level for cheese spread is about 20 percent. It would be desirable to prepare stacks of individual slices of any type of process cheese and to prepare stacks of individual slices of cheese foods and cheese spreads without incurring the problem of sticking together of the slices.

Accordingly, it is a principal object of the present invention to provide a method for preparing stacks of individual slices of cheese products whereby the individual slices may be readily separated from each other. It is another object of the present invention to provide a method for effecting easy release of individual slices of cheese products when the slices are arranged in a stack.

These and other objects of the present

invention will become apparent from the following detailed description, and the accompanying drawing, wherein:

Figure 1 is a diagrammatic, perspective view, partially broken away, of apparatus useful in the practice of the present invention; and

Figure 2 is a perspective view illustrating a methed for assembling a plurality of cheese strips into a stacked array.

Generally, in accordance with various features of the present invention, a stack of individual slices of a cheese product is provided. At least one surface of each individual slice in the stack is provided with a thin coating of a hydrated hydrocolloid. The preferred hydrocolloid is a gelatinized starch product. The invention further provides a method for applying the hydrocolloid to a cheese product during the high-speed manufacture of individual slices of the cheese product.

Referring now to the drawings, apparatus is set forth generally as described in United States Patent No. 2,352,210 to Kraft, which is suitable for forming stacks of individual slices of cheese. In the drawings, cheese, in sheet or leaf form is formed into ribbons or web-like strips designated S, and the ribbons are brought into relatively superposed face-to-face relation with their longitudinal side edges accurately registered. As shown in Figure 2, a plurality of strips or ribbons S, when assembled in the manner stated, form a multi-ply elongated bar or loaf of cheese which may be cut transversely as indicated by the dotted line 10 in Figure 2, to form a packagable loaf of individual slices of cheese. The slices may be formed by the apparatus of any desirable thickness, but it is desirable that the thickness in any event be such that the individual cheese slices are ready for use merely upon separation from the assembly of individual slices and without slicing the thickness thereof.

The apparatus, as shown in Figure 1, for producing the individual cheese slices, comprises a drum 11, a doctor roll 13 and a take-off roll 19. The drum 11, the roll 13 and the roll 19 are journaled for rotation in suitable roller bearings which are supported by brackets in a suitable frame structure; said bearings, brackets and frame structure are not shown.

Cheese, preferably process cheese in molten or fluid form, is delivered from processing apparatus (not shown) to a hopper or head box 15 which is supported on frame members (not shown). The hopper 15 is provided with a downwardly inclined outlet spout or nozzle 17 which delivers the molten or fluid cheese into the nip or bite of the doctor roll 13 and drum 11 which are rotated in such direction that cheese is rolled out between them into a thin sheet or web 14 which is caused to follow the drum 11.

From the drum 11, the web 14 of cheese is delivered to take-off roll 19. The cheese web 14 travels upwardly over and downwardly from the take-off roll 19 and while on the roll is slitted into a plurality of parallel ribbons or strips S by means of a series of circular slitting knives 21.

The ribbons S of cheese are guided from the take-off roll 19 downwardly and each ribbon of cheese is twisted through an angle of 90°. The cheese ribbons pass around and under spools 23 and are delivered to a conveyor 25 which carries the plurality of stacked cheese ribbons forwardly for cutting to provide stacks of individual cheese slices and any desired packaging or other operations.

While particular apparatus has been described for the manufacture of individual slices of cheese, it should be understood that the method of the present invention for treating cheese products which are formed into stacked slices is suitable for the treatment of cheese formed into stacked slices by any apparatus.

With further reference to the apparatus of Figure 1 and 2, the drum 11 is of hollow construction and is provided internally with a cooling fluid. When molten cheese is delivered into the bite of the drum 11 and roll 13, the cheese will be rolled out into a thin sheet or web 14 on the surface of the drum 11. The temperature of the drum 11 is maintained at a sufficiently low point that the cheese web 14 will be sufficiently set as it emerges from between the roll 13 and drum 11 to be self-sustaining in sheet form, corresponding in thickness to the space between the roll 13 and drum 11. During the path of travel of the cheese web 14 around the drum 11, the cheese web 14 is gradually cooled and becomes more completely set so that by the time it is transferred to the take-off roll 19 it is of adequate strength to avoid tearing and to insure the delivery of a continuous web of cheese to the slitting knives 21. For separating the cheese web or sheet from the drum 11 for delivery to the roll 19, there is provided a wire 27 which extends transversely of the surface of the drum 11 and is also disposed at an angle so as to extend in a minor degree circumferentially of the roll. The wire 27 is anchored in the frame structure (not shown). The wire 27 serves to effectively separate the cheese web 14 from the surface of the drum 11 and leaves the drum surface clean and in condition for further cooperation with the roll 13 in a continued formation of a cheese web.

In accordance with the present invention, a thin film of hydrated hydrocolloid is applied to the cheese web at some point prior to forming the web into stacked individual slices of cheese. It is preferred that the

hydrocolloid be applied to the cheese by spraying an aqueous dispersion of the hydrocolloid onto the surface of the cheese at some point prior to forming the cheese into stacked individual slices. The exact point of application of the hydrated hydrocolloid is not critical and the hydrated hydrocolloid may be applied to the cheese web 14 at any point after the cheese web 14 is formed by passing between the bite of drum 11 and roll 13. The point of application may also be onto the cheese web after the cheese web has been removed from the drum 11 onto the take-off roll 19. Also, the hydrated hydrocolloid may be applied to the clean surface of the drum 11 at a point between take-off roll 19 and roll 13. When the hydrated hydrocolloid is applied to the surface of drum 13, transfer of the hydrated hydrocolloid onto the cheese web occurs after the cheese web is formed and it is traveling over the surface of the drum 11 prior to take-up onto the take-off roll 19.

The hydrocolloid may be selected from edible food starches, vegetable gums, such as quar gum, carob bean gum, gum tragacanth and gum karaya; marine gums, such as carrageenan and alginate; cellulose gums, such as carboxymethylcellulose and mixtures thereof. Preferred hydrocolloids for use in the present invention are food starches. A particularly preferred hydrocolloid is cornstarch. Also particularly preferred are mixtures of hydrocolloids wherein at least 50 percent of the mixture is a food starch.

A dispersion of the hydrocolloid is prepared by combining the hydrocolloid with water to form a slurry. Certain hydrocolloids are readily hydrated with cold water, whereas other of the suitable hydrocolloids require heating to effect hydration. In general, the hydrocolloid is present in the dispersion at a level sufficient to provide a level of the hydrocolloid of from 2 to 10 percent by weight of the dispersion. At lower levels of use, it is difficult to spray a sufficient quantity of the hydrocolloid onto the surface of the cheese product. At higher concentrations than the indicated range, the hydrocolloid usually provides a dispersion viscosity which is too high to provide a suitable dispersion for spraying onto the cheese product.

It is preferred that the hydrocolloid dispersion be heated whether or not heating is required to effect hydration. In this connection, heating pasteurizes the hydrocolloid and prevents the hydrocolloid from contaminating the surface of the cheese. Cheese products, particularly cheese products with high levels of moisture, are highly suitable materials for development of mold and other microbiological growth. For this reason, it is preferred that the fluid dispersion of the hydrocolloid be heated to a temperature and for a time sufficient to effect pasteurization of the dispersion. A temperature of from 160°F to 200°F for a period of time of at least 30 minutes is usually sufficient to effect pasteurization. Lower periods of time (though preferably at least 5 minutes) may be used at the higher temperature of the range and the time may even be as low as about 1 minute at 200°F. When a food starch is used as the hydrocolloid, it is preferred that a fluid dispersion of the food starch be heated to a temperature of from about 185°F to about 200°F so as to effect gelatinization and hydration of the starch.

The hydrocolloid is applied to the surface of the cheese at a level sufficient to provide from 0.01 to 1.0 grams of hydrocolloid (dry basis) per square foot of surface area of the cheese products (moist basis), preferably from 0.05 to 0.10 grams of hydrocolloid per square foot of surface area. It has been found that the application of the hydrocolloid need be only on a single surface of the cheese to effect suitable separation of stacks of cheese slices. At levels below the indicated range, stacked individual slices of various cheese products, as previously discussed, are not readily separated. Levels higher than the indicated range may be used, but no additional benefit is derived from such higher levels and the cost of application is higher. Also, at levels higher than the indicated range, the hydrocolloid provides a visible, dull surface on the cheese product which is considered to be undesirable. It is not necessary that the hydrocolloid film be continuous and at lower levels of application within the indicated range the hydrocolloid film is usually discontinuous. The amount of discontinuity is not important so long as the level of application is within the indicated range.

In a preferred method of application of the hydrocolloid, a fluid dispersion of the hydrocolloid is first prepared. The fluid dispersion is then heated to effect hydration and pasteurization as previously indicated. The heated fluid dispersion of the hydrocolloid is then sprayed onto the surface of a web of cheese as the cheese web is being produced by the apparatus previously described or other suitable apparatus. As indicated, the point of application of the fluid dispersion of the hydrocolloid is not critical. It is not necessary that the moisture contributed by the fluid dispersion of the hydrocolloid be removed completely from the surface of the cheese product. While some moisture loss will occur as the cheese web is being cooled on the drum of the cheese apparatus, complete drying of the spray of the fluid dispersion is not required. At the indicated level of application of the fluid dispersion of the hydrocolloid, as much as about 0.5 to about 1.0 percent of moisture

may be contributed by the fluid dispersion, based on a weight of the cheese product.

The following examples further illustrate various features of the present invention, but are intended to in no way limit the scope of the invention, which is defined in the appended claims:

EXAMPLE I

A cheese food formulation having 42 percent moisture was prepared from the following list of ingredients:

Ingredients	Weight Percent
Cheddar cheese	
Aged 6 months	36.0
Aged 1 month	36.0
Whey powder	5.0
Non-Fat Dry Milk	3.5
NaCl	.5
Emulsifying Salts	2.6
Sorbic Acid	.2
Water	16.2

The cheese food was prepared by mixing together the above ingredients in a process cheese cooker as heat was applied to the cooker. The cheese food formulation was heated to a temperature of 165°F at which time the cheese food formulation was fluid.

The cheese food formulation was then formed into single slices by means of apparatus as previously described. The cheese food formulation was pumped to a hopper 15 which fed the cheese food formulation through a nozzle 17 into the bite of a roll 13 and a drum 11. A cheese web 14 was formed on the surface of the drum 11 and was taken off onto a roll 19 where the web of cheese was cut into slices by means of slitting knives 21.

A dispersion was prepared having three percent cornstarch and 97 percent water. The slurry was prepared by slowly adding the cornstarch to the water as the water was stirred. The starch dispersion was then heated to a temperature of 185°F so as to gelatinize the starch and was held at that temperature until used. The minimum holding time was 5 minutes.

The hot starch dispersion was then sprayed onto the cheese web 14 on the drum 11 at a point immediately following the formation of the cheese web 14 between the drum 11 and the roll 13. The starch dispersion was uniformly applied by means of spray nozzles onto the surface of the cheese web at a level sufficient to provide 0.072 grams of starch (dry basis) per square foot of cheese web surface (wet basis).

The cheese web was formed into stacked strips of cheese and the stacked strips were cut at periodic intervals to provide stacks of cheese food slices having a rectangular size of 3 inches by 3 inches and having 8 slices per stack. The stacks of slices were stored at a temperature of 45°F for a period of 150 days. At the end of this storage period the slices were examined and it was determined that the slices readily separated from each other.

A control run was also made from the same cheese food formulation as described above. In the control run no starch was applied to the cheese web during the formation of the stacked slices. When these stacks of slices were examined after a comparable period of storage, it was determined that the individual slices were very difficult to separate from each other and in most cases an individual slice would tear before complete separation could be made.

EXAMPLE II

A cheese food formulation was prepared in accordance with the formulation of Example I. The cheese food formulation was made into stacks of individual slices as described. Various hydrocolloid materials were prepared as fluid dispersions and were sprayed onto the web of cheese as it was formed on the drum. The hydrocolloid materials used were guar gum, carregeenan and carboxymethylcellulose. In the case of guar gum and carrageenan, the application of the hydrocolloid was sufficient to provide a level of hydrocolloid of 0.051 ppm (dry basis) per square foot of cheese product surface (wet basis). In the case of carboxymethylcellulose the application of the hydrocolloid was sufficient to provide a level of 0.012 grams of methylcellulose per square foot of cheese product surface. Each of the hydrocolloids used provided stacked slices of cheese which were more readily separated from each other than was a stack of a controlled cheese food preparation wherein a hydrocolloid material had not been applied. However, the separation of stacked slices was not effected quite as easily as stacked slices of Example I, wherein cornstarch was used as the hydrocolloid.

In accordance with the present invention, a method has been provided where stacked colloid is selected from edible food starches, arated from each other. The method is particularly adapted to the preparation of stacked slices of cheese products having higher moisture than process cheese. The method is also applicable to lower moisture cheeses wherein a sticking problem may be encountered. The method of the invention is suitable for high speed production of individual slices of cheese which are arranged in a stacked array.

WHAT WE CLAIM IS:—

1. An improved multi-ply loaf of cheese slices which may be readily utilized comprising a plurality of cheese slices placed

one upon another in face-to-face relationship so as to provide a stack of cheese slices and a thin film of hydrated hydrocolloid interposed between adjacent cheese slices in said stack whereby said cheese slices may be readily separated one from another.

2. An improved food product in accordance with Claim 1 wherein said hydrocolloid is selected from edible food starches, vegetable gums, marine gums and cellulose gums.

3. An improved food product in accordance with Claim 1 wherein said hydrocolloid is a food starch.

4. An improved food product in accordance with Claim 3 wherein said food starch is cornstarch.

5. An improved food product in accordance with Claim 1 wherein said hydrocolloid is present at a level of from 0.01 to 1.0 grams per square foot of surface of said cheese slices.

6. A method for treating cheese comprising forming cheese into two or more sheets, providing an aqueous dispersion of a hydrocolloid, spraying said aqueous hydrocolloid dispersion onto at least one surface of said cheese sheets so as to provide a thin film of said hydrocolloid on said surface, and placing at least two of said cheese sheets in face-to-face relationship with said hydrocolloid layer interposed therebetween whereby said cheese sheets may be subsequently easily separated one from another.

7. A method in accordance with Claim 6 wherein said hydrocolloid is selected from edible food starches, vegetable gums, marine gums and cellulose gums.

8. A method in accordance with Claim 6 wherein said hydrocolloid is a food starch.

9. A method in accordance with Claim 8 wherein said food starch is cornstarch.

10. A method in accordance with Claim 6 wherein said hydrocolloid is present in said aqueous hydrocolloid dispersion at a level of from 2 to 10 percent by weight of the dispersion.

11. A method in accordance with Claim 6 wherein said aqueous hydrocololid dispersion is heated to a temperature and for a time sufficient to effect pasteurization of the dispersion.

12. A method in accordance with Claim 11 wherein said heating is to a temperature of from 160°F to 200°F for a period of time of at least 30 minutes at the lower temperature to at least five minutes at the higher temperature and intermediate periods of time at intermediate temperatures.

13. In a method for manufacture of a multi-ply loaf or stack of cheese slices wherein cheese is formed into a thin sheet, the sheet is slit into ribbons of predetermined width, the ribbons are guided into relatively superposed assembled relationship and the assembled ribbons are cut transversely to form a multi-ply loaf of cheese slices, the improvement comprising providing an aqueous dispersion of a hydrocolloid and applying said dispersion onto said cheese sheet or cheese ribbons prior to assembling said cheese ribbons into relatively superposed relationship so as to provide a thin film of said hydrocolloid between adjacent plies of the multi-ply loaf of cheese slices.

14. A method in accordance with Claim 13 wherein said hydrocolloid is selected from edible food starches, vegetable gums, marine gums and cellulose gums.

15. A method in accordance with Claim 14 wherein said hydrocolloid is a food starch.

16. A method in accordance with Claim 15 wherein said food starch is corn-starch.

17. A method in accordance with Claim 13 wherein said hydrocolloid is present in said aqueous hydrocolloid dispersion at a level of from 2 to 10 percent by weight of the dispersion.

18. A method in accordance with Claim 13 wherein said aqueous hydrocolloid dispersion is heated to a temperature and for a time sufficient to effect pasteurization of the dispersion.

19. A method in accordance with Claim 18 wherein said heating is to a temperature of from 160°F to 200°F for a period of time of at least 30 minutes at the lower temperature to at least five minutes at the higher temperature and at intermediate times at intermediate temperatures.

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Chartered Patent Agents,
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Printed for Her Majesty's Stationery Office by Burgess & Son (Abingdon), Ltd.—1973.
Published at The Patent Office, 25 Southampton Buildings, London, WC2A 1AY,
from which copies may be obtained.

1318849 COMPLETE SPECIFICATION
1 SHEET *This drawing is a reproduction of the Original on a reduced scale*

FIG.1

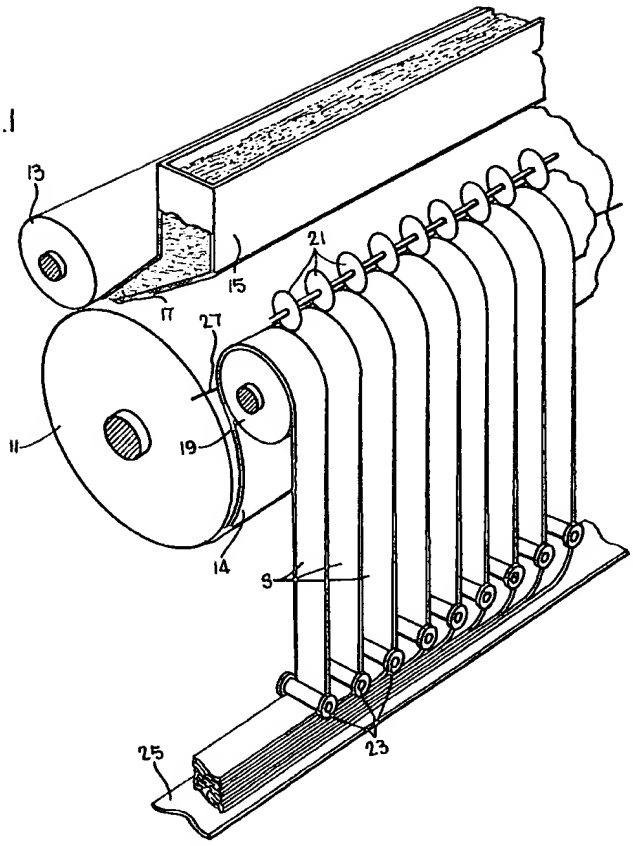

FIG.2